Interior Design Voice AI Agent - Technical Documentation

Table of Contents

System Overview

The Interior Design Voice AI Agent serves as an automated lead qualification and client communication platform developed for Interia, a North Indian interior design company focused on turnkey residential projects. This system streamlines the initial client engagement by automatically retrieving leads from Airtable, making voice calls through Vapi, qualifying leads using predefined criteria, and updating lead statuses in the database.

The solution comprises two main n8n workflows:

1. **Outbound Calling Workflow**: Automatically runs every 2 hours to identify leads marked as "TBC" (To Be Called) and initiate first contact calls.

2. **Call Result Processing Workflow**: Triggered by webhooks receiving call event data from Vapi, processing call outcomes, and determining next actions based on established logic.

This automation significantly reduces manual workload for Interia's design team, ensures consistent lead qualification, and enhances customer experience through prompt follow-ups and professional interactions.

Architecture Diagram

```
┌─────────────────────────┐ ┌─────────────────────────┐
┌──────────────────────────┐
│          │ │          │ │          │
│ Airtable      │◄──────┤ n8n Workflows   │◄──────┤ Vapi Voice Agent │
│ Lead Database  │ │          │ │          │
│          │ │          │ │          │
└─────────────────────────┘ └─────────────────────────┘
└──────────────────────────┘
     │          │          │
     │          │          │
     ▼          ▼          ▼
┌─────────────────────────┐ ┌─────────────────────────┐
┌──────────────────────────┐
│          │ │          │ │          │
│ Twilio        │ │ Ngrok         │ │ Google API      │
│ Call Service     │ │ Webhook Tunnel   │ │ Email Service    │
│          │ │          │ │          │
└─────────────────────────┘ └─────────────────────────┘
└──────────────────────────┘
```

Tools and Technologies

1. **n8n**

   - Version: Latest stable version (as of April 2025)
   - Purpose: Workflow automation platform orchestrating the complete process
   - Key Functions:
     - Scheduled lead retrieval
     - API requests to Vapi for call initiation
     - Webhook handling for call events
     - Lead status management in Airtable
     - Email notifications
2. **Vapi**

   - Purpose: AI voice assistant platform for call automation
   - Key Functions:
     - Voice synthesis using AI voice models
     - Natural language processing for conversation
     - Conversation intelligence powered by LLMs
     - Call handling and routing
     - Webhook event generation

3. **Twilio**
    - Purpose: Telephony service for handling actual calls
    - Key Functions:
        - Outbound call initiation
        - Call status tracking
        - Voice transmission
4. **Airtable**
    - Purpose: Database for lead management
    - Tables:
        - Leads Table: Stores lead information and status
        - Call Records Table: Stores detailed call data
5. **Google API**
    - Purpose: Email notification service
    - Key Functions:
        - Sending notification emails to leads
        - Confirmation emails for scheduled consultations
6. **Ngrok**
    - Purpose: Secure tunneling for webhook handling
    - Key Functions:
        - Exposing local webhook endpoints to the internet
        - Ensuring Vapi callbacks reach n8n workflows

Data Structure

Leads Table

Field Name	Type	Description
id	Text	Unique identifier for each lead
First Name	Text	Lead's first name
Last Name	Text	Lead's last name
Mobile	Text	Lead's contact number
Email	Text	Lead's email address
Status	Single Select	Current status of the lead (TBC/In-Progress/Called/Failed)

Attempt Number	Number	Count of call attempts
Date Time	DateTime	Timestamp of lead creation/modification
Summary	Long Text	Summary of conversation with lead
Assignee	Text	Designer assigned to the lead
Reason	Text	Reason for failure (if applicable)

Call Records Table

Field Name	Type	Description
id	Text	Unique identifier for each call record
callproviderID	Text	ID assigned by call provider (Vapi/Twilio)
phonenumberID	Text	ID of the phone number used
customernumber	Text	Customer's phone number
type	Text	Type of call (outbound/inbound)
started	DateTime	Call start time
ended	DateTime	Call end time
milliseconds	Number	Call duration in milliseconds
cost	Number	Cost of the call
ended_reason	Text	Reason for call termination
transcript	Long Text	Full transcript of the call

Workflow 1: Outbound Calling

This workflow executes on a schedule every 2 hours to identify leads with "TBC" status and initiate calls. The workflow automatically updates lead status based on call initiation results.

Detailed Node Breakdown:

1. **Schedule Trigger Every 2 Hours**
    - Node Type: Schedule Trigger

- Configuration:
  - Interval: Every hour
  - Active: Monday to Sunday, 9 AM to 6 PM
- Purpose: Automatically initiates the workflow at regular 2-hour intervals throughout the business day
- Output: Trigger signal with timestamp

2. **Find Record**

   - Node Type: Airtable
   - Configuration:
     - Operation: Search Records
     - Base: Interior Design Airtable base
     - Table: Leads Table
     - Filter: `{Status} = "TBC"`
   - Purpose: Finds all records in the "Leads Table" of the Interior Design Airtable database that have a "Status" of "TBC" (To Be Confirmed)
   - Output: Array of lead records matching the filter criteria

3. **Edit Fields**

   - Node Type: Set
   - Configuration:
     - Assignments:
       - ID: `={{ $json.id }}`
       - FirstName: `={{ $json["FirstName"] }}`
       - Mobile: `={{ $json.Mobile }}`
   - Purpose: Extracts the ID, FirstName, and Mobile fields from each record and stores them as variables for later use in the workflow
   - Output: Simplified lead data with only necessary fields

4. **First Call**

   - Node Type: HTTP Request
   - Configuration:
     - Method: POST
     - URL: `https://api.vapi.ai/call`
     - Headers:
       - Authorization: Bearer [VAPI_API_KEY]
       - Content-Type: application/json
     - Request Body:

```
{
  "assistant_id": "YOUR_ASSISTANT_ID",
  "phone_number_id": "YOUR_PHONE_NUMBER_ID",
  "customer": {
    "phone_number": "{{ $json.Mobile }}",
```

```
  "name": "{{ $json.FirstName }}"
 },
 "webhook_url": "{{ $node['HTTP Request'].json.webhook_url }}",
 "metadata": {
  "lead_id": "{{ $json.ID }}"
 }
}
```

- Purpose: Makes an API request to Vapi.ai to initiate the first call to the customer
- Output: Call initiation response with call_id and status

5. **Update Status and Increment Attempt**
   - Node Type: Airtable
   - Configuration:
     - Operation: Update Record
     - Base: Interior Design Airtable base
     - Table: Leads Table
     - Record ID: `={{ $json.ID }}`
     - Fields to Update:
       - Status: "In-Progress"
       - Attempt: "Previous value" +1
   - Purpose: Updates the lead status in Airtable to "In-Progress" and increments the number of attempts by 1 after initiating a request for call.
   - Output: Updated record confirmation

Workflow 1 Execution Flow:

1. The workflow is triggered automatically every 2 hours
2. It searches Airtable for leads with "TBC" status
3. For each lead found, it extracts the necessary information (ID, FirstName, Mobile)
4. It makes an API request to Vapi to initiate a call to the customer
5. The lead status is updated to "In-Progress" and increments number of attempts in Airtable

Workflow 2: Call Result Processing

This workflow is triggered by a webhook that receives call event data from Vapi. It processes call outcomes and determines next steps based on whether the call was successful, requires a retry, or has failed after maximum attempts.

Detailed Node Breakdown:

1. **Webhook**

- Node Type: Webhook
- Configuration:
  - Method: POST
  - Path: /vapi-callback
  - Response Mode: Last Node
- Purpose: Entry point that receives incoming call event data from an external webhook
- Output: Webhook payload with call details

2. **Event = end-of-call-report**

   - Node Type: IF
   - Configuration:
     - Condition: `{{ $json.event === "end-of-call-report" }}`
   - Purpose: Conditional node that evaluates to true when an end-of-call report is received from the webhook
   - Output: Routes to "true" path if condition is met, otherwise "false"

3. **Enter Data In Call Records Table**

   - Node Type: Airtable
   - Configuration:
     - Operation: Create Record
     - Base: Interior Design Airtable base
     - Table: Call Records
     - Fields:
       - callproviderID: `={{ $json.call_id }}`
       - customernumber: `={{ $json.customer.phone_number }}`
       - type: `={{ $json.direction }}`
       - started: `={{ $json.started_at }}`
       - ended: `={{ $json.ended_at }}`
       - milliseconds: `={{ $json.duration_ms }}`
       - ended_reason: `={{ $json.ended_reason }}`
       - transcript: `={{ $json.transcript }}`
   - Purpose: Creates a record in Airtable's "Call Records" table with call details
   - Output: Created record confirmation

4. **Condition = Call Answered**

   - Node Type: IF
   - Configuration:
     - Condition: `{{ $json.ended_reason === "completed" }}`
   - Purpose: Checks if the call was properly completed/answered and routes accordingly
   - Output: Routes to appropriate path based on call completion status

5. **Get ID #1 (Success Path)**
    - Node Type: Airtable
    - Configuration:
        - Operation: Search Records
        - Base: Interior Design Airtable base
        - Table: Leads Table
        - Filter: `{Mobile} = "{{ $json.customer.phone_number }}"`
    - Purpose: Searches Airtable for lead records matching the caller's phone number
    - Output: Lead record matching the phone number
6. **Update Status to Called**
    - Node Type: Airtable
    - Configuration:
        - Operation: Update Record
        - Base: Interior Design Airtable base
        - Table: Leads Table
        - Record ID: `={{ $json.id }}`
        - Fields to Update:
            - Status: "Called"
            - Summary: `={{ $node["Webhook"].json.summary }}`
    - Purpose: Updates the lead status in Airtable to "Called" after a successful call
    - Output: Updated record confirmation
7. **Send Mail to Email id**
    - Node Type: Google Sheets
    - Configuration:
        - Operation: Send Email
        - To: `={{ $json.Email }}`
        - Subject: "Regarding Your Interior Design Inquiry - Interia"
        - Body:

          Dear {{ $json.fields['FirstName'] }},

          Thank you for contacting us about Interia's interior design services. We had a wonderful conversation and appreciated learning about your needs. Our team will be following up with you soon to continue our discussion about your project.

          Warm regards,

          The Interia Team

8. **Get ID #2 (Retry Path)**
    - Node Type: Airtable
    - Configuration:
        - Operation: Search Records
        - Base: Interior Design Airtable base
        - Table: Leads Table
        - Filter: `{Mobile} = "{{ $json.customer.phone_number }}"`
    - Purpose: Retrieves the lead record from Airtable by searching for the customer's phone number for retry logic
    - Output: Lead record matching the phone number
9. **Incrementing Number of Attempts**
    - Node Type: Airtable
    - Configuration:
        - Operation: Update Record
        - Base: Interior Design Airtable base
        - Table: Leads Table
        - Record ID: `={{ $json.id }}`
        - Fields to Update:
            - Attempt: `={{ $json.Attempt + 1 }}`
    - Purpose: Updates the attempt counter for the lead in Airtable
    - Output: Updated record with incremented attempt count
10. **Number of Attempts less than 2**
    - Node Type: IF
    - Configuration:
        - Condition: `{{ $json.Attempt < 2 }}`
    - Purpose: Checks if the call attempt count is below threshold (2) to determine if another attempt should be made
    - Output: Routes based on attempt count comparison
11. **Wait for 1 Minute**
    - Node Type: Wait
    - Configuration:
        - Wait Amount: 1
        - Unit: Minutes
        - Resume Mode: After time interval
    - Purpose: Pauses workflow execution for 60 seconds before making another call attempt

- Output: Original data after wait period

12. **Second Call**

    - Node Type: HTTP Request
    - Configuration:
        - Method: POST
        - URL: `https://api.vapi.ai/call`
        - Headers:
            - Authorization: Bearer [VAPI_API_KEY]
            - Content-Type: application/json
        - Request Body:

```
{
  "assistant_id": "YOUR_ASSISTANT_ID",
  "phone_number_id": "YOUR_PHONE_NUMBER_ID",
  "customer": {
    "phone_number": "{{ $json.Mobile }}",
    "name": "{{ $json.FirstName }}"
  },
  "webhook_url": "{{ $node['HTTP Request'].json.webhook_url }}",
  "metadata": {
    "lead_id": "{{ $json.ID }}",
    "attempt": "{{ $json.Attempt }}"
  }
}
```

* Purpose: Makes an API request to Vapi.ai to initiate a follow-up call to the customer
* Output: Call initiation response with call_id and status

12. **Update Status To TBC** * Node Type: Airtable * Configuration: * Operation: Update Record * Base: Interior Design Airtable base * Table: Leads Table * Record ID: `={{ $json.ID }}` * Fields to Update: * Status: "TBC" * Purpose: Updates the lead status in Airtable to "TBC" for further calls * Output: Updated record confirmation

13. **Get ID #3 (Failure Path)**

    - Node Type: Airtable
    - Configuration:
        - Operation: Search Records
        - Base: Interior Design Airtable base
        - Table: Leads Table
        - Filter: `{Mobile} = "{{ $json.customer.phone_number }}"`
    - Purpose: Retrieves the lead record when attempts exceed the threshold

   - Output: Lead record matching the phone number
14. **Update Status to Failed**
   - Node Type: Airtable
   - Configuration:
     - Operation: Update Record
     - Base: Interior Design Airtable base
     - Table: Leads Table
     - Record ID: `={{ $json.id }}`
     - Fields to Update:
       - Status: "Failed"
   - Purpose: Updates the lead status in Airtable to "Failed" after maximum attempts
   - Output: Updated record with failed status
15. **Set Unreachable**
   - Node Type: Airtable
   - Configuration:
     - Operation: Update Record
     - Base: Interior Design Airtable base
     - Table: Leads Table
     - Record ID: `={{ $json.id }}`
     - Fields to Update:
       - Reason: "Unreachable"
   - Purpose: Sets the reason field to "Unreachable" for failed contact attempts
   - Output: Updated record with reason
16. **Send Mail to Email id**
   - Node Type: Google Sheets
   - Configuration:
     - Operation: Send Email
     - To: `={{ $json.Email }}`
     - Subject: "Regarding Your Interior Design Inquiry - Interia"
     - Body:

Dear {{ $json.FirstName }},

Thank you for your interest in Interia's interior design services. We've been trying to reach you to discuss your project requirements but haven't been able to connect.

Please feel free to call us back at your convenience or let us know a suitable time when we can reach you.

Warm regards,
The Interia Team

* Purpose: Sends a simple text email to the lead's email address with a message that someone will contact them soon
* Output: Email send confirmation

Workflow 2 Execution Flow:

1. The workflow is triggered when a webhook receives call event data from Vapi
2. If the event is an "end-of-call-report", the workflow proceeds to record call details
3. The workflow checks if the call was properly completed/answered:
    - For completed calls:
        - The lead status is updated to "Called"
        - Call summary is stored
        - Send confirmation mail
    - For unanswered calls:
        - The attempt counter is incremented
        - If attempts are less than 2:
            - Wait for 1 minute
            - Initiate a second call
            - Update status to "TBC" for tracking
        - If attempts are 2 or more:
            - Update status to "Failed"
            - Set reason to "Unreachable"
            - Send email notification to the lead

Voice Agent Configuration

The voice agent is configured in Vapi with specific parameters to ensure effective lead qualification. The configuration includes identity settings, conversational style, and specific qualification questions.

Voice Assistant Configuration

Identity & Purpose

You are Rohan, a professional voice assistant for Interia, a leading interior design firm in North India. Your primary objective is to qualify leads by gathering essential information about their interior design project requirements. You represent Interia with professionalism and warmth, embodying the company's commitment to excellence in design.

Voice & Persona

You have a warm, professional tone that inspires confidence. Your speech is clear, well-paced, and articulate with a slight North Indian accent that feels local and relatable. You are knowledgeable about interior design, consultative in approach, and genuinely interested in understanding client needs.

Conversation Flow

1. Introduction: Begin with a friendly greeting, identify yourself, and explain the purpose of your call.
2. Confirmation: Verify if it's a convenient time to speak.
3. Need Discovery: Ask open-ended questions to understand their project requirements.
4. Qualification Assessment: Gather specific information about budget, timeline, location, project scope, and property size.
5. Next Steps: Based on qualification criteria, schedule a consultation or recommend appropriate follow-up.
6. Professional Closing: Thank them for their time and end with a positive note about their project.

Key Qualification Questions

1. Budget Exploration: "For projects of this nature, our services typically start at a minimum of ₹30 lakhs for turnkey residential designs. Is this something that aligns with the budget you've considered for your project?"
2. Location Assessment: "To better understand the context of your project, could you share the approximate location of your property? Just the sector or colony and the city would be helpful at this stage."
3. Timeline Expectations: "What's your timeline for starting this project? Are you looking to begin within the next month, or do you have a longer timeframe in mind?"
4. Project Scope: "Are you interested in a complete turnkey solution where we handle everything from design to execution, or are you looking for specific services?"
5. Property Size: "Could you tell me the total square footage of your property?"

Response Guidelines

- Keep responses concise and to the point, typically 2-3 sentences.
- Use interior design terminology appropriately but avoid jargon that might confuse clients.
- Maintain a consultative approach rather than a hard-selling tone.
- Listen actively and acknowledge the client's inputs before proceeding to the next question.
- If a client provides vague answers, gently probe for more specific information without being pushy.

Edge Case Handling

- If a client mentions they are in a meeting or busy: Apologize for the interruption and offer to reschedule at a more convenient time.

- If a client expresses disinterest: Thank them for their time and politely end the call.
- If a client becomes hostile or uses abusive language: Remain professional, avoid escalating the situation, and politely end the call if necessary.
- If a client claims they never inquired: Apologize for the confusion, verify their information, and end the call if they insist it was a mistake.
- Don't ask the same question twice if the client has already provided an answer.
- Don't push if a client seems reluctant to share certain information.

Lead Qualification Criteria

A lead is considered "hot" if:

- Budget is ₹30 lakhs or more
- Timeline is within the next 3 months
- Project involves complete turnkey solutions
- Property is located in serviceable areas of North India
- Property size is at least 1500 sq ft

Edge Case Handling

The system is designed to handle various edge cases that may occur during call interactions:

1. **Call Failures**
    - Detection: Call ended with reason other than "completed"
    - Handling:
        - Increment attempt counter
        - Retry after 1 minute if attempts < 2
        - Mark as "Failed" with reason "Unreachable" after 2 attempts
        - Send notification email to the lead
2. **Abusive Language**
    - Detection: Voice agent detects inappropriate language
    - Handling:
        - Agent responds professionally without escalating
        - If abuse continues, agent politely ends the call
        - Call is marked as "Called" with summary noting the interaction
3. **Identity Denial**
    - Detection: Client claims they never inquired about services
    - Handling:
        - Agent apologizes for the confusion
        - Verifies contact information

        - If discrepancy confirmed, marks lead as "Failed" with reason "Wrong Contact"
4. **Call Back Requests**
    - Detection: Client requests to be called at a specific time
    - Handling:
        - Agent confirms the preferred time
        - Updates lead status to "TBC" with note about callback time
        - System reschedules call based on requested time

Security Considerations

Data Protection

- All personal data is stored in Airtable with proper access controls
- API keys are stored securely in n8n credentials manager
- Call recordings and transcripts are handled according to data protection regulations

Authentication

- All API integrations use secure authentication methods
- Webhooks are secured using signature verification
- Access to n8n workflows is restricted to authorized personnel

Compliance

- Call recordings notify customers that calls may be recorded
- System adheres to telecommunications regulations for automated calling
- Data retention policies are implemented for call recordings and transcripts

Troubleshooting Guide

Common Issues and Solutions

Workflow 1 Issues

Issue	Possible Cause	Solution
Workflow not triggering	Schedule configuration incorrect	Verify schedule settings and timezone
No leads found	Filter criteria too restrictive	Check Airtable filter formula

API call to Vapi failing	API key expired or incorrect	Verify API key and regenerate if necessary
Status update failing	Incorrect record ID reference	Check ID mapping in workflow

Workflow 2 Issues

Issue	Possible Cause	Solution
Webhook not receiving events	Ngrok tunnel expired	Restart Ngrok tunnel with permanent subdomain
Call record creation failing	Missing field mappings	Verify field mappings in Airtable node
Retry logic not working	Attempt counter not incrementing	Check increment logic in workflow
Email notifications not sending	Google API authentication issue	Refresh Google API credentials

Maintenance and Monitoring

Regular Maintenance Tasks

- Check Ngrok tunnel status daily
- Monitor API usage and quota limits
- Review call recordings for quality assurance
- Update voice agent prompts based on performance

Performance Monitoring

- Track lead conversion rates
- Monitor call completion percentage
- Analyze average call duration
- Review call transcripts for improvement opportunities

Alerting

- Set up alerts for workflow failures
- Monitor for repeated call failures
- Track API rate limit warnings
- Set threshold alerts for high failure rates

Installation and Setup Instructions

Prerequisites

- n8n installed (v0.233.0 or later recommended)
- Airtable account with API access
- Vapi account with voice assistant capabilities
- Twilio account with phone numbers for testing
- Google account for email API access
- Ngrok installed for webhook tunneling

Step 1: Airtable Setup

1. Create a new base named "Interior Design"
2. Create "Leads Table" with the following fields:
    - id (Text)
    - First Name (Text)
    - Last Name (Text)
    - Mobile (Text)
    - Email (Text)
    - Status (Single Select: TBC, In-Progress, Called, Failed)
    - Attempt (Number) (Default value 0)
    - Date Time (DateTime)
    - Summary (Long Text)
    - Assignee (Text)
    - Reason (Text)
3. Create "Call Records Table" with the fields listed in Data Structure section
4. Generate API key from Airtable Account settings

Step 2: Vapi Setup

1. Sign up for Vapi account
2. Create a new voice assistant
3. Configure assistant with the prompt structure provided in Voice Agent Configuration section
4. Set up webhook URL to your Ngrok endpoint
5. Generate API key from Vapi dashboard

Step 3: Ngrok Setup

1. Install Ngrok
2. Run command: `ngrok http 5678` (or your n8n webhook port)
3. Note the generated HTTPS URL for webhook configuration

Step 4: n8n Setup

1. Install n8n using npm: `npm install n8n -g`
2. Start n8n: `n8n start`
3. Access n8n dashboard at `localhost:5678`
4. Configure credentials:
    - Airtable API key
    - Vapi API key
    - Google API credentials
    - Twilio credentials
5. Import the provided workflows (JSON files) or create them following the documentation

Step 5: Configure Workflows

1. Update API endpoints in HTTP Request nodes
2. Set webhook URL in Vapi configuration to your Ngrok URL
3. Update database references to match your Airtable base and table IDs
4. Activate the Schedule Trigger for Workflow 1

Required Credentials

Service	Credential Type	Purpose
Airtable	API Key	Database access
Vapi	API Key	Voice assistant API
Twilio	Account SID & Auth Token	Call service
Google	OAuth2	Email service
n8n	User & Password	Workflow access